

Heated Thermoplastic Fiber Placement Head for NASA Langley Research Center, Phase I

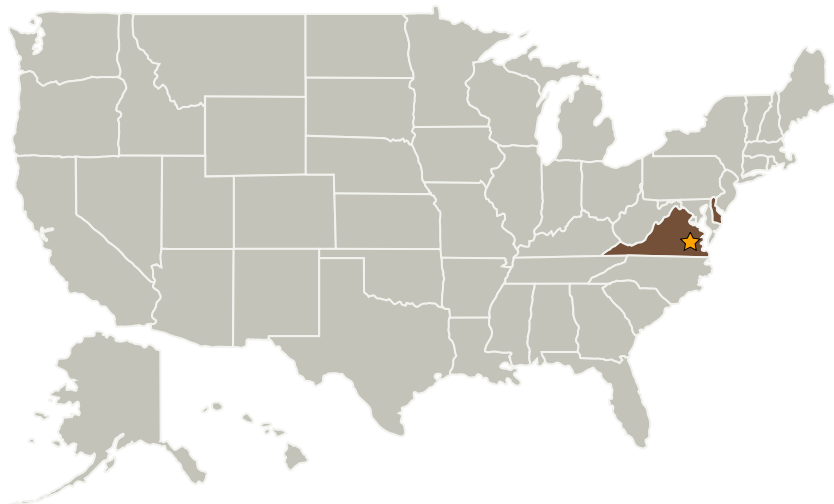
Completed Technology Project (2004 - 2004)



Project Introduction

Reduced mass composite materials are crucial to the success of aerospace systems, but are inhibited by expensive autoclave consolidation, especially for large parts. To remedy this, NASA-LaRC has been developing cost-effective high-performance thermoplastic composite materials for years. NASA materials could dramatically reduce the cost of large aerospace structures, because those materials avoid the autoclave. However, NASA lacks a robust, cost-effective fabrication process to tow-place these emerging materials into laminates, and thus can't evaluate their usefulness to industry. This program develops for NASA-LaRC the processing equipment that allows material evaluation and allows out-of-autoclave fiber placement. In particular, this program will deliver a heated in situ deposition head to fit on NASA-LaRCs placement machine. Heads can also be sold to industrial companies for existing placement machines so that aerospace composites can be fabricated out of the autoclave. In phase I, the deposition head will be designed and reviewed with NASA. The process window requirements for the placement head for NASA materials will be verified. In phase II, we will complete the design, fabricate, install, and prove-out the head equipment. We then start up the deposition head at NASA so that the emerging NASA-LaRC materials can be proven in laminates.

Primary U.S. Work Locations and Key Partners



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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Langley Research Center (LaRC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★ Langley Research Center(LaRC)	Lead Organization	NASA Center	Hampton, Virginia
Accudyne Systems, Inc.	Supporting Organization	Industry	Newark, Delaware

Primary U.S. Work Locations

Delaware	Virginia
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Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Principal Investigator:

Mark B Gruber

Technology Areas

Primary:

- TX09 Entry, Descent, and Landing
 - └ TX09.1 Aeroassist and Atmospheric Entry
 - └ TX09.1.1 Thermal Protection Systems